

REMARKS

Claims 21-25, 27-36, 45-54 are pending in the present application. As a result of a previous restriction requirement, claims 37-44 were cancelled. Reconsideration of all rejected claims is respectfully requested.

Election / Restriction

Claims 47-54, submitted with the response filed September 27, 2004, were further subject to restriction. The requirement for restriction and constructive election is traversed. Reconsideration of the requirement for restriction is respectfully requested. The Office Action stated, "The combination as claimed does not require the particulars of the subcombination as claimed because the combination does not require independent movement between substrate and module. The subcombination has separate utility such as selectively placing module inside and outside process environment," page 4, line 20 – page 5, line 3. This statement appears to indicate that the subcombination (of claim 47) requires independent movement between substrate and module. However, claim 47 (the subcombination) does not appear to require separate movement of the substrate and module. "The connection allowing relative movement of the electronics module with respect to the instrumented substrate," claim 47, lines 11-12. Thus, it is not clear what new utility is referred to with respect to claim 47. Similarly, process claim 52 does not require relative movement of the substrate and module as the Office Action appears to indicate. Because the restriction and constructive election appear to be based on a misreading of the claims, reconsideration is requested.

Claim Rejections under 35 USC 103

Claims 21, 35, 45 and 46 were rejected under 35 USC 103(a) as unpatentable over Akram (US Patent 6,472,242) in view of Lauf (US Patent 5,969,639). This rejection is not well understood. In particular, certain features of the rejected claims do not appear to be shown by the cited references, the motivation to combine the references is not clear, and it appears that Lauf teaches away from such a combination.

Claim 21 recites, "a remote data processing system, and wherein the data transmission circuitry comprises a wireless transceiver to transmit the processing conditions to the remote

system.” No such system appears to be shown by Akram. The Office Action appears to infer the existence of a “process control” in the apparatus of Akram. “Examiner considers thermometer 16, which collects the temperature data, also communicates with the process control,” page 2, lines 14-15. “Akram discloses processing the data to ‘facilitate substrate temperature control’ (column 1 lines 29-35) but Akrams’ communication between the circuitry 12 and such process control is not expressly ‘wireless’ as in the instant invention,” page 7, lines 14-16. However, the cited portion of Akram (column 1, lines 29-35) does not appear to describe data processing. Processing to “facilitate substrate temperature control” appears to refer to providing thermal contact between wafers and a hot plate. “A partial vacuum is typically used to pull small diameter wafers into direct thermal contact with a hot plate. Such processing methods facilitate substrate temperature control because the substrate temperature is closely associated to the temperature of the hot plate.” Column 1, lines 31-35 (emphasis added). Thus, this portion of Akram appears to refer to wafer processing and does not appear to disclose a remote data processing system.

Furthermore, Akram does not disclose communication, wireless or otherwise, with such a unit by external circuitry 12 of Akram. Akram discloses, “External circuitry 12 includes communication devices in other embodiments of the invention to transmit process conditions,” column 3, lines 53-55. However, this does not necessarily require any additional unit and may simply refer to transmission through connections 14 or some alternative transmission within external circuitry 12. Because the remote data processing system of claim 21 is not shown by the prior art, no *prima facie* case of obviousness is made with respect to claim 21.

Claim 21 further recites, “an electronics module having a second perimeter that encloses the same or less area than the first perimeter.” The Office Action stated, “the Akram figures are generally illustrative of the general configuration of the structure,” page 3, lines 5-6, apparently inferring the relative size of thermometer 16 and workpiece 10 from Figure 1A. However, MPEP 2125 states, “Proportions of features in a drawing are not evidence of actual proportions when drawings are not to scale.” Because Akram does not appear to disclose that drawings are to scale, any inference as to relative sizes of thermometer 16 and workpiece 10 is submitted to be improper. Because this claim element is not shown by Akram, no *prima facie* case of obviousness is made with respect to claim 21.

The rejection of claim 21 in the Office Action appears to be based on adding wireless communication according to Lauf to resistance thermometer 16 of Figure 1A of Akram (see "Response to Arguments" on pages 2-3). However, it is not seen how this combination is suggested by the references. Such a combination would appear to leave cable 14 extending from workpiece 10 as acknowledged by the Office Action, "the data ... would be communicated using RF taught by Lauf, which would leave the cable in place," page 2, lines 16-18. However, this would appear to be contrary to the teaching of Lauf, which states with respect to prior art devices, "The entire setup is fragile, because the wires are extremely thin. Conversely, making the wires thicker has an adverse effect on the accuracy Furthermore, the wires interfere with placement of probes Lastly, it is obvious that a hard-wired wafer cannot be used to measure temperatures in a rotating environment such as an operating photoresist spin bowl," column 1, lines 40-50. Thus, Lauf appears to teach away from "leads connecting the substrate to the electronics module," of claim 21.

"References cannot be combined where reference teaches away from their combination," MPEP 2145 X.D.2. The Office Action stated, "Lauf does indeed teach away from wires running from the sensors to points outside the processing environment," page 2, lines 19-20. It appears that the Office Action takes the position that thermometer 16 of Akram is inside the "processing environment." "Examiner notes that Akram says nothing about where the thermometer 16 of Akram is placed. It may be inside." Page 2, lines 5-6. However, the significance of this is not well understood. Whether thermometer 16 is inside or outside a process environment, it would appear that wires extending from a substrate to a unit such as thermometer 16 would be contrary to the teachings of Lauf. In other words, Lauf does not appear to only teach away from wires running from sensors to points outside the processing environment, as indicated by the Office Action. Lauf appears to teach away from any wires extending away from a substrate, regardless of their destination. Furthermore, there appears to be no basis for asserting that thermometer 16 is inside a processing environment.

Claims 22-25, 27-36, 45 and 46 depend from claim 21 and are believed to be allowable at least for depending from an allowable base claim. In addition, claims 22-25, 27-36, 45 and 46 recite additional limitations that are not shown by the cited references.

Claim 45 recites two relative positions of the electronics module with respect to the substrate. Figure 2 of Akram appears to show only one location of resistance thermometer 16 with respect to substrate 10.

Claims 22, 24, 25, 27, 28 and 33 were rejected as unpatentable over Akram as modified by Lauf and further in view of Smesny. However, the motivation to modify the apparatus of Akram according to the teachings of Lauf and further modify according to the teachings of Smesny is not understood. In particular, as discussed above, Lauf appears to teach away from combination with Akram. Furthermore, Smesny appears to teach away from combination with Akram. In particular, Smesny discloses, "Pad 24 is of sufficient size to allow repeated mechanical alignment and contact with an external probe source. Probe pad 24 allows data to be input into circuit 22 necessary for programming and reprogramming of processor 20," column 7, lines 47-51. Also, "Probe pad 26, may be configured similar to input probe pad 24 for allowing mechanical access from an external output device necessary for receiving digital information stored within the read/write memory of processor 20," column 7, lines 53-57. Thus, Smesny appears to teach using probe pads 24, 26 to form temporary connections for exchange of data. The apparatus of Smesny appears to be operable to collect data while these pads are not in use (see example of Figure 5). Thus, Smesny appears to teach away from a wired apparatus, such as that of Akram. Also, Smesny teaches "Wafer 10 includes numerous circuits formed upon its surface topography according to standard fabrication techniques," column 6, lines 37-39. See also Figure 1. This appears to teach away from an electronics module comprising signal acquisition circuitry and data transmission circuitry that is coupled to a substrate by leads.

Claim 33 recites, "the data transmission circuitry comprises one or more connectors to couple a remote system to the device with a communications cable." The Office Action acknowledged that such a cable was not shown by Akram, but indicated that probe pad 26 of Smesny was relevant to this claim. However, this reference to probe pad 26 of Smesny is not well understood. In particular, even if probe pad 26 of Smesny is considered a connector for a cable (which does not appear to be disclosed), this would not appear to be a connector of the data transmission circuitry because the data transmission circuitry is in an electronics module (see claim 21).

Claims 29 and 34 recite limitations regarding "the remote system." Claims 29 and 34 were rejected under 35 USC 103(a) as unpatentable over Akram as modified by Lauf and further

in view of Schwartz. Schwartz does not appear to teach or suggest a particular location for adjustment operations such as that of claim 29. Therefore, claim 29, which is limited to the remote system, is submitted to be allowable over this combination. The Office Action stated “it would have been obvious ... to process the calibration correction either on the thermometer 16 or remotely where Akram discloses ‘methods that facilitate substrate temperature control’,” page 11, lines 8-11. However, as discussed above, Akram does not appear to disclose a remote data processing system. Because this claim element is not shown by the references, claims 29 and 34 are submitted to be additionally allowable. Claim 34 is amended to depend from claim 21.

Claim 30 was rejected as unpatentable over Akram in view of Larson (US Patent 6,651,488). The Office Action acknowledged, “Akram does not expressly teach a transceiver transmits and receives RF signals.” “Transceiver system 28” of Larson was cited for this claim element. However, Larson describes “wireless interrogation system 28,” column 4, lines 41-42, that appears to have no wires or leads connecting to substrate 14. In contrast, claim 21 from which claim 30 depends recites, “leads connecting the substrate to the electronics module.” Thus, Larson does not appear to suggest the structure of claim 30 but rather, Larson (like Lauf) appears to teach away from the claimed structure that has both wires and wireless communication. The motivation cited to modify Akram with the interrogation system of Larson was “saving power on the isolated substrate having limited supply of power by transmitting only intermittently.” However, the substrate of Akram does not appear to be isolated because it is connected via connections 14. Akram discloses “An electrical signal entering via one of electrical interconnects 40, 41 passes through temperature sensing device 30a and exits through the opposite electrical interconnect,” column 7, lines 11-14. Akram also discloses, “Interface connection 18 is configured to provide electrical coupling of electrical interconnects 40, 41 and the respective temperature sensing devices 30 with circuitry 12 external of electronic device workpiece 10,” column 4, line 64 - column 5, line 1. Thus, workpiece 10 of Akram appears to receive power from circuitry 12, which includes connections 10. Replacing such a hard-wired system with a wireless system and an isolated substrate would appear to create a situation of an isolated substrate having a limited supply of power. It is not clear how creating such an apparatus would be motivated by “saving power on the isolated substrate having a limited supply of power” as indicated by the Office Action (page 12, line 8). Therefore, modifying Akram to use a wireless interrogation system such as that of Larson would appear to be contrary to the

cited motivation. In addition, the substrate of claim 30 is not isolated as there are "leads connecting the substrate to the electronics module." Therefore, it is not seen how the cited motivation could lead to the claimed structure.

With respect to claim 31, the Office Action appears to cite the elimination of wiring of Lauf as motivation for the combination of Akram, Larson and Lauf to obtain the claimed structure. However, it is not seen how this could be motivation to obtain an apparatus that includes "leads connecting the substrate to the electronics module" of claim 31 (recited in claim 21). Instead, the cited motivation appears to show a teaching away by Lauf.

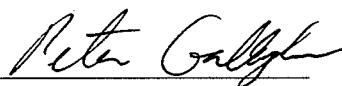
Claim 32 recites, "the transceiver transmits and receives sonic signals." Output pad 26 of Smesny was cited as teaching this claim feature. However, output pad 26 of Smesny appears to be for communication between the substrate and an external communication device. "Probe pad 26 can also be a non-contact receptor for allowing optical or acoustic access from an external communication device," column 7, lines 57-59, and Figure 1. In contrast, the transceiver of claim 32 is in the electronics module and there are "leads connecting the substrate to the electronics module," see claim 21. Thus, the output pad 26 of Smesny does not appear to show the transceiver of claim 32.

Claim 34 is amended to depend from claim 21.

CONCLUSION

In view of the amendments and remarks contained herein, it is believed that all claims are in condition for allowance and an indication of their allowance is requested. However, if the Examiner is aware of any additional matters that should be discussed, a call to the undersigned attorney at: (415) 318-1167 would be appreciated.

Respectfully submitted,


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Date